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SEPTEMBER 25, 1948

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Centennial Greetings

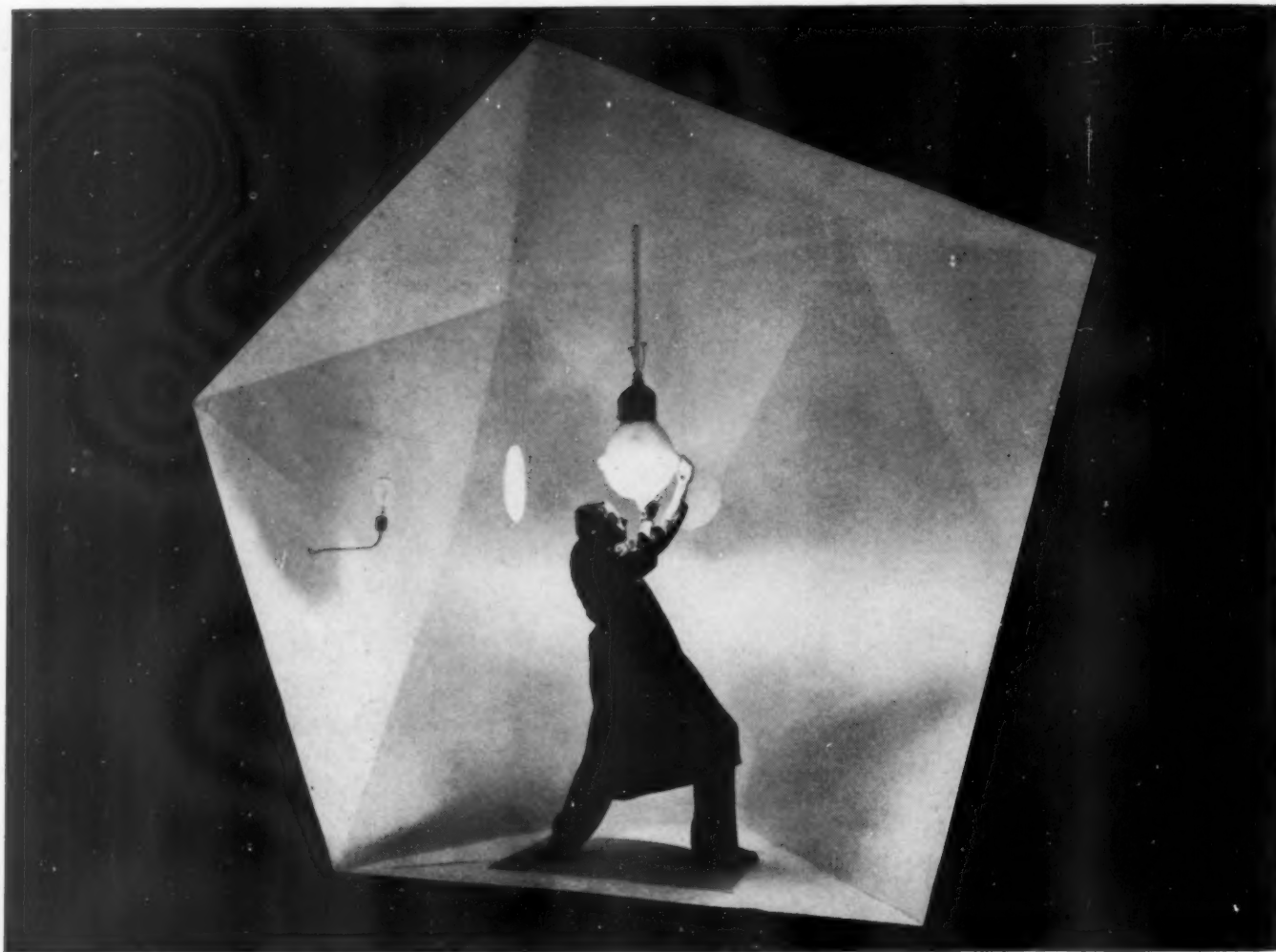
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VOL. 34 NO. 12

YOU CAN BE SURE... IF IT'S Westinghouse



Who needs a laboratory WITH 20 SIDES?

The answer is—a Westinghouse lighting engineer. The reason? So he can test street lighting units before they are put into production.

To measure the efficiency of street lights, research engineers at the Cleveland Lighting Plant designed and built the structure shown above. Known as an "icosahedron", it has 20 snow-white walls which reflect light perfectly. Over-all efficiency is measured by a photocell behind a small window in one side.

In addition, to make sure that street lighting equipment will maintain the desired perform-

ance under actual operating conditions, it is installed by Westinghouse engineers on a specially-built street located near the plant. Only then, after a series of exhaustive tests... including exposure to severe weather... is the unit released for production.

This type of exacting research is not confined to the development of better street lighting units. It is standard procedure throughout the Westinghouse organization, whether the product is an electric iron or a steam turbine. You can be sure... if it's Westinghouse.

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PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

PHYSICS

Mesons Explode in Body

You and everything else on earth are constantly bombarded with cosmic ray particles. This produces an explosion in your body every minute.

► ONCE A MINUTE even as you read this a meson explodes inside your body and produces three pieces of sub-atomic "shrapnel," one mysterious bullet of which could penetrate literally millions of miles of lead.

Hot on the trail of what happens to cosmic ray particles when they disappear near the earth's surface after having come in from outer space, Dr. John A. Wheeler, Princeton physicist, pictured for the American Association for the Advancement of Science, meeting in Washington, what happens.

Only one of the three pieces of the splitting of the meson (that's the cosmic ray particle) has been actually discovered—the electron, the unit of electricity. Another piece is the neutrino, a neutral particle that is almost not there at all (it has what the physicists call zero rest mass). This is the one that has such neutrality, small size and great energy that it could drive through solid lead for 200,000,000,000,000 miles! Since 1932 when Prof. W. Pauli conceived

it, scientists have been confident that it actually exists because they need it to explain what happens in the atomic world. But they despair of finding it.

The third particle is a neutral meson, undetected, but probably 50 times the weight of an electron, contrasted with the original meson of 200 times the electron's mass. It, too, is very energetic.

Everything on earth, including you and your friends, is bombarded constantly by this radiation from the depths of the universe. It has been going on for ages, so far as we know. The idea of the way particles die and give birth to other particles is new.

A Brazilian, Dr. Jayme Tiomno, aided Dr. Wheeler in his research, while Dr. W. Y. Chang on leave from Peiping University discovered upon cosmic ray photographs the strange appearance of an electron that bobbed up some distance from where a meson was stopped dead in its track.

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NEW ADMINISTRATIVE SECRETARY—Dr. Howard A. Meyerhoff, geologist at Smith College, Northampton, Mass., succeeds Dr. F. R. Moulton, as secretary of the A. A. A. S.

GENERAL SCIENCE

Administrative Secretary Of A.A.A.S. Appointed

► DR. HOWARD A. MEYERHOFF, professor of geology at Smith College, Northampton, Mass., has been appointed administrative secretary of the American Association for the Advancement of Science, to succeed Dr. Forest Ray Moulton, noted astronomer, who has held the post for the past 12 years.

A native of New York City, Dr. Meyerhoff was educated in the public schools of that city and completed his college training at the University of Illinois. He received master's and doctor's degrees in geology at Columbia University. Although he has been on the teaching staff of Smith College 24 years, he has been professionally active in the Caribbean, where he has served as geologist on the Scientific Survey of Puerto Rico and the Virgin Islands, consultant to the Dominican Republic and adviser on many public and private projects. He has recently returned from an Andean expedition in Argentina, which he directed.

The new administrative secretary brings an assortment of non-professional experience to his job. He was director of civilian defense in the Connecticut Valley region of Massachusetts during the war, and he also served as mediator and chief hearings officer on the National War Labor Board from 1942 to 1945. For nine years he was chairman of the Board of Directors of the Proper-McCallum Hosiery Company, and has been chairman of the Arbitration Board

GENETICS

Biochemistry of Genes

► HOW CAN PEOPLE and plants and animals be so much alike yet so different from even their closest kin?

Biochemical explanations for the strange workings of heredity were offered before the meeting in Washington of the American Association for the Advancement of Science by a series of speakers: Prof. Tracy M. Sonneborn of Indiana University, Prof. David Bonner of Yale University, Prof. Curt Stern of the University of California and Prof. Laurence H. Snyder of the University of Oklahoma.

Discussion of heredity, whether in men, mice or microbes, always revolves around genes. Nobody has ever seen a gene, just as nobody has ever seen electricity; scientists are sure of their existence because of the things they catch them doing.

Genes are submicroscopic units of living stuff that roost on or in the chromosomes, which are small rod-shaped or round bits of specialized protoplasm that can be seen with a microscope within the nuclei of cells. They are considered to be chemically highly potent, able to cause and control the production of various substances in the rest of the cell's protoplasm, which is known as cytoplasm.

These actions of the genes on the cyto-

plasm may determine the development of such body chemicals as the coloring matter in hair, skin and eyes, the various blood-group factors, and the enzymes and hormones that operate in digestion, respiration and other body functions. Abnormal action on the part of the genes may produce such inherited chemical disturbances as diabetes and gout.

Individual differences apparently arise through differences in the response of cytoplasm to the chemical influences of the genes. It even seems likely that some of these cytoplasmic entities which the genes help to set up become quasi-independent, producing types of hereditary transmission that are carried on mainly or altogether in the cytoplasm.

Tiny animals like fruitflies, and latterly even one-celled forms like certain molds and protozoa, have been favorite experimental material for this kind of research because they are inexpensive to maintain, breed readily and rapidly, and do not present such complexities in interpreting results as are presented in the uncontrolled matings of human beings. Eventually the results of these laboratory researches are often capable of expression in human terms.

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of the Maryland Drydock Company in Baltimore. For several years he has been active in the work of the Industrial Mineral Division of the American Institute of Mining and Metallurgical Engineers.

Dr. Meyerhoff has served the Association as secretary of the Section on Geology and

Geography from 1937-1940, and as executive secretary in 1945-46. He was also vice president in 1944. He plans to continue his academic duties at Smith College until June 1949, although he will take office in January, when Dr. Moulton retires.

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tor, Harvard College Observatory, Cambridge, Mass., retiring president of the A. A. A. S.; Dr. Elvin C. Stakman, University of Minnesota, president-elect 1949; Dr. E. U. Condon, Director, National Bureau of Standards, Washington, D. C.; and Dr. F. R. Moulton, Administrative Secretary, A. A. A. S., Washington, D. C.

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Letters To The Editor

New Clotting Factors

For the sake of historic accuracy concerning the discovery of new clotting factors (SNL, Sept. 4), it should be mentioned that in 1943 I discovered a hitherto unknown factor essential for prothrombin activity (AMERICAN JOURNAL OF PHYSIOLOGY, 140, 212, 1943) which undoubtedly is the same as the agent Dr. Paul A. Owren of Oslo, Norway, found one year later. In addition to this substance which I named the labile factor I have subsequently presented evidence that two additional factors are essential for prothrombin activity (AMERICAN JOURNAL OF PHYSIOLOGY, 151, 63, 1947).—Dr. Armand J. Quick, Professor of Biochemistry, Marquette University School of Medicine.

Rainbows within Rainbow

In the Colorado River Valley area numerous rainbows are seen during the spring and summer.

On Aug. 5 at 6:45 p. m. MST, my wife, family and I were attracted by a particularly bright rainbow. This rainbow was a conventional bow with red outside and green inside. However, three smaller concentric contiguous rainbows were inside the main rainbow. In addition, an inverse rainbow with green outside and red inside could be seen plainly about 15 degrees outside the main rainbow.

The brightness of the bow decreased considerably in the few minutes that my

daughter spent looking for my movie camera loaded with color film, so no photographs were taken.

Is such a sight unusual? What conditions must exist for these rainbows to be seen?—Tell Ertl, Rifle, Colo.

What a pity you did not get that camera in time as such a gorgeous array of rainbows—primary, secondary and several supernumerary bows—are seldom seen. Dr. W. J. Humphreys, formerly of the U. S. Weather Bureau, reports that he has seen supernumerary bows both inside the primary bow and outside the secondary one. He has spotted as many as half a dozen, crowded close together, inside the major rainbow. For such a spectacular display, Dr. Humphreys says the sunlight must be exceedingly bright and the rain heavy, but clear air between you and the rainbow.

On This Week's Cover

► IN COMMEMORATION of its centennial, the American Association for the Advancement of Science was offered congratulations from many foreign countries. On the cover Sir Oliver Franks, the British Ambassador, is shown offering a scroll from the British Association for the Advancement of Science to Dr. Edmund W. Sinnott, president of the association, on the opening evening of the week-long session. Seated left to right in the first row on the platform are: Dr. Harlow Shapley, Direc-

tor, Harvard College Observatory, Cambridge, Mass., retiring president of the A. A. A. S.; Dr. Elvin C. Stakman, University of Minnesota, president-elect 1949; Dr. E. U. Condon, Director, National Bureau of Standards, Washington, D. C.; and Dr. F. R. Moulton, Administrative Secretary, A. A. A. S., Washington, D. C.

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ASTRONOMY

Earth Due for Ice Age

Maybe in another million years the earth will again be dominated by ice. This will happen when the solar system becomes surrounded by a dense dust cloud.

► THE EARTH is due for a new Ice Age. It should happen in the next million years, but just when not even scientists were willing to predict at the American Association for the Advancement of Science meeting in Washington.

Ice will dominate the earth when the sun again becomes surrounded by a dense cloud of dust. Several times in the past million years dark nebulae in the solar system have brought glacial periods that changed the course of earthly life.

Dr. Donald H. Menzel, Harvard astronomer, advanced this new theory to the scientists.

The sun has been traversing a dark nebula, from which it emerged only 50,000 years ago, Dr. Menzel pictured. The denser portions of the nebula, by reflecting part of the sun's radiation back to the earth, produced the warm interglacial periods; the less-dense regions of the dark cloud gave the eras of ice accumulation.

If this theory is correct, Dr. Menzel stated, the outer fringes of the nebula are only about 20 million miles away, in the direction of the constellation Columba, the dove. Since the nebula as a whole may be quite thin compared with the average dark nebula, no clue is given to its presence by noticeable dimming of the light of distant stars.

Our present climate, variable as it is, is not representative of that experienced throughout geological history. The earth has undergone a number of separate and distinct periods of glaciation, with interim periods when the climate was appreciably warmer than at present. Magnolia trees, for instance, once flourished in Greenland.

Within the past million years the earth has experienced four separate periods of glaciation, Dr. Menzel pointed out. Great glaciers occurred simultaneously on all continents and probably in both hemispheres.

In the course of geological time, our sun has probably passed through many dark nebulae, the Harvard astronomer stated. A dark nebula is so tenuous that the material between the earth and the sun would exert a negligible effect on the amount of heat and light reaching us. But an extensive cloud, even if partially transparent, could scatter an appreciable amount of radiation back to the earth. The total sunlight reaching the earth might be increased five, ten, or even 15%, he suggested.

"At first sight, one might conclude that

the excess radiation would produce an effect just the opposite to that of an ice age," Dr. Menzel said. "A cold age, however, is not necessarily an ice age. An accumulation of ice and snow requires both high evaporation of water from the oceans and high transport of the moisture-laden air to the poles."

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GENERAL SCIENCE

Atomic Progress Endangered By Unfair Investigations

► ATOMIC PROGRESS is endangered in this country because atomic scientists are exposed to abuse, distortion and defamation through unfair investigations, Chairman David E. Lilienthal of the Atomic Energy Commission told the American Association for the Advancement of Science.

Although he mentioned no persons or

group, it was plain he was referring to the investigations being made by the House Un-American Activities Committee on the loyalty of certain American scientists.

"It is ironic," he pointed out, "that this danger should become acute at the time when specific achievements have just been chalked up to the credit of this country's technical management forces engaged in atomic work—achievements, I may add, that are of importance to every man, woman and child in this country."

He called this a dangerous situation because "a healthy atomic energy program simply cannot stand still. It goes ahead, with greater and greater momentum, or it goes to pot."

Government employment has become in a very real sense a hazardous occupation, Mr. Lilienthal said. "If such damaging and painful occurrences should become common then inevitably self-respecting men will refuse in ever increasing numbers to work for their Government, and this Government, and therefore this Nation, will be in grievous trouble."

Our progress depends on having the very best qualified people in the United States, he said. "We must have more of them, and we must have them right away. Otherwise we face the imminent threat of stagnation. It is this that makes the present situation grave and ominous," Mr. Lilienthal declared.

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AAAS-GEORGE WESTINGHOUSE SCIENCE WRITING AWARDS—Chairman David E. Lilienthal of the Atomic Energy Commission is shown addressing AAAS members and science writers. Seated in foreground, left to right, are: Dr. Edmund W. Sinnott, president of the AAAS; Dr. Howard A. Meyerhoff, new administrative secretary; and George H. Bucher, vice-chairman of the Westinghouse Electric Corp.

CHEMISTRY

Man-Made Food Possible

► **MAKING** an artificial green plant out of colored dyes and chemicals is not too wild a dream and could save the world from eventual famine of food and energy.

Dr. Farrington Daniels of the University of Wisconsin rates the atomic energy development as a more difficult job than developing artificial photosynthesis, which means a factory that can use sunlight directly to build food out of carbon dioxide and water.

He told the American Association for the Advancement of Science in Washington that he would have guessed ten years ago that photo-synthesis without plants would come before atomic energy.

Atomic energy won the race because \$2,000,000,000 was spent developing the chance discovery of fission of uranium. The investment in research upon photosynthesis has been negligible.

Dr. Daniels predicted for the future:

We shall eat wood in the future. Thousands of tons of yeast made from sugars converted from wood were used in Europe during the war. Trees and quick-growing bushes and grass grown on poor soil will furnish the wood necessary.

Weeds and algae from the oceans and

freshwater streams and lakes will be harvested for food.

Farm wastes will be converted into carbon monoxide and hydrogen and then processed into motor fuels, in factories located like creameries in local areas.

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Problem in Trip to Moon

► **FOR THOSE** who hope to fly to the moon and beyond with atomic power space ships, Prof. Eugene P. Wigner of Princeton has discouraging facts. The difficulty is getting rid of the waste heat from the tremendously concentrated nuclear energy source (the energy of fission corresponds to 600,000,000 degrees Centigrade of temperature). Computations show that an atomic engine rocket would barely be able to escape from the planet because of this heat problem.

For ocean ships, to which mobile atomic power will probably be first applied, the need of protecting against the intense radioactivity is more of a limitation, which Prof. Wigner believes can be overcome.

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ECOLOGY

Cooperation with Nature

► **MAN'S** boasted "conquest of nature" must yield place to a cooperation with nature, if man is to survive, Dr. Stanley A. Cain of the Cranbrook Institute of Science warned, at the meeting in Washington of the American Association for the Advancement of Science.

We are used to thinking of land plants, whether crops, pastures or forests, as renewable resources, in contrast to such exhaustible resources as ores and oils. Such, however, is not necessarily the case, Dr. Cain declared. When man sweeps a forest off a mountainside and then lets fire ravage the thin soil, that forest will not be renewed in anything like human terms of time. Similarly, when man over-exploits cattle range or corn land, what remains will be unprofitable masses of weeds, or bare, gully-scarred clay, renewing nothing that man can use.

"We may be certain that a balance of nature will be attained; but we can not be certain that this balance will be one pleasing to man," he commented.

Efforts of conservation-minded groups have been largely ineffectual to date, the speaker pointed out, because such groups have put their main efforts into trying to influence politicians to pass (or reject) certain legislation, instead of devoting themselves to the broad education in con-

servation of the voters who elect (or reject) the politicians.

At the same session, Prof. G. E. Hutchinson of Yale University examined the effect of man's activities on the distribution and use of two chemical elements essential for life, carbon and phosphorus. In general, man's interference in the course of nature has been to intensify and make more continuous the exploitation of these indispensable elements, thereby rendering the inhabited part of the planet less fit for life.

"We have reached a point in this process when human assets are the only thing that we have in abundance," he declared. "Any future economy of abundance must be based on human ingenuity rather than on abundance of raw materials. The main obstacles to such a development are fear of war and a wrong orientation on the part of the public towards natural resources."

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POPULATION

"Standing Room Only" In Another 2,000 Years

► **IN 2,000 YEARS** there will be "standing room only" on earth if the population continues to increase at the present rate of about 2,000,000 a month. Dr. Brock Chis-

holm, Director General of the World Health Organization, made this prediction at the American Association for the Advancement of Science meeting in Washington.

As a temporary relief measure to feed the present population of the world, WHO plans to pick out areas that are promising for food production but are held back by disease. Medical aid would then be given these disease-ridden areas, such as parts of India and Africa.

Dr. Chisholm recognized that this was just a temporary measure that would probably lead to an increase in population in these sections. He pointed out that, in time, population control will become inevitable.

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PSYCHOLOGY

Russia's Loud Vetoes Are Healthy, Psychiatrist Says

► **IT IS** a healthy sign to have Russia voicing her "nos" in public rather than reserving them for the diplomatic consulting room, a psychiatrist told the American Association for the Advancement of Science in Washington.

"It is wholesome for Russia to be expressing herself in Tass and Pravda and for that to be reported in our press," Dr. Kenneth E. Appel of the University of Pennsylvania declared.

He compared this public thrashing out of troubles to the work of the psychiatrist who helps the individual by allowing him to freely express all his accumulated fear and hostility. Discussion and understanding help the patient back to health.

"The same attitude that the wholesome parent adopts toward the belligerent or non-conforming child and psychiatry shows to the patient who is suffering from emotional excesses, should be adopted towards nations who are suffering from nationalistic, adolescent struggles in maturity," Dr. Appel advised.

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ZOOLOGY

Hair May Come from Warts Of Toad-Like Ancestor

► **THE HAIRS** of your head (and the whiskers on your chin, too, if you are a male) may be the descendants of warts that graced the hide of a toad-like ancestor, 100,000,000 years or so ago.

This suggestion was made before the meeting of the American Society of Zoologists in Washington, by Prof. Hans Elias of Middlesex University. Careful dissection of the warts of certain species of toads has disclosed structures basically resembling those of mammalian hair, he said. In the toad, these structures seem to be special sense organs.

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GENERAL SCIENCE

Truman's AAAS Address

"These are truths that every scientist knows. They are truths that the American people need to understand," he said, referring to unfair attacks on scientists.

The complete text of the A. A. A. S. address of President Harry Truman on Sept. 13 follows:

► I AM DEEPLY HONORED in being with you tonight on the one hundredth anniversary of the founding of the American Association for the Advancement of Science. As President of the United States, I welcome you to Washington.

In the 100 years since this Association was organized, science has helped transform the United States into the most productive nation in the world. I know that in your meetings this week you will be looking back over the progress of American science in the past century. I also know that you are much more interested in looking into the future.

You are looking forward, I know, because we stand at this moment at the threshold of revolutionary developments. Scientific research daily becomes more important to our agriculture, our industry, and our health. The members of this Association know better than I what developments to expect in the years ahead in physics, in chemistry, in biology and the other sciences, but I am certain of this—that science will change our lives in the century ahead even more than it has changed them in the hundred years just past.

Science and National Policy

I hope you will also be thinking about the relationship between science and our national policy.

Two years ago, I appointed a Scientific Research Board. Its report, entitled *SCIENCE AND PUBLIC POLICY*, was submitted last fall. The report stressed the importance of science to our national welfare, and it contained a number of important recommendations.

The most important were these:

First, we should double our total public and private allocations of funds to the sciences. We are now devoting, through Federal and private expenditure, little more than one billion dollars for research and development per year. With a national income of more than \$200 billion annually, the Board felt that we should devote at least \$2 billion to scientific research and development each year.

Second, greater emphasis should be placed on basic research and on medical research.

Third, a National Science Foundation should be established.

Fourth, more aid should be granted to

the universities, both for student scholarships and for research facilities.

Fifth, the work of the research agencies of the Federal Government should be better financed and coordinated.

I hope that you have been weighing these recommendations carefully, and that if you agree with me that they are sound, you will consider how they can be made effective national policies.

I know that you are also deeply concerned with the relationship of science to our national defense and security. Three years ago, when the fighting stopped, all of us were eager to return to our peacetime pursuits. The first thought of a great many of us was how to translate our wartime advances in scientific knowledge into better standards of living.

It is an unfortunate fact, however, that the peace we hoped for has not come quickly. We are still living in hazardous times. We are required to give unremitting

thought to the defense of the United States at a period when defense has become incredibly more difficult. American scientists must, like all the rest of our citizens, devote a part of their strength and skill to keeping the Nation strong. At a time when we hoped our scientific efforts could be directed almost exclusively to improving the well-being of our people, we must, instead, make unprecedented peacetime efforts to maintain our military strength. For we have learned—we have learned the hard and bitter way—that we cannot hope for lasting peace with justice if we do not remain strong in the cause of peace.

Leadership in Science

If we are to maintain the leadership in science that is essential to national strength, we must vigorously press ahead in research. There is one simple axiom on which this thought is based. The secrets of nature are not our monopoly. Any nation that is willing and able to make the effort can learn the secrets that we have learned. Such a nation may, indeed, discover new facts of nature we have not yet discovered.

Our problem, therefore, is not a static one of preserving what we have. Our problem is to continue to engage in pure—or fundamental—research in all scientific fields. Such research alone leads to striking developments that mean leadership. Yet it

(Continued on page 203)



PHYSICISTS PUT THEIR HEADS TOGETHER—These professors of physics attended the A. A. A. S. meeting in Washington to report recent advances to the scientists gathered there. They are, seated left to right: Dr. C. M. G. Lattes, University of California; and Dr. John A. Wheeler, Princeton U. Standing, left to right: Dr. Jayme Tiomno, Princeton U.; Dr. Willis E. Lamb and Dr. I. I. Rabi, of Columbia U. (See p. 195)

AGRICULTURE

More Food Will Come with Better Knowledge of Soil

► **BETTER-FED PEOPLE** through better understanding of soil types and their productive capacities was the program called for at the meeting in Washington of the American Association for the Advancement of Science, by Prof. William A. Albrecht of the University of Missouri.

Early waves of pioneer settlers, and even the bison they drove before them, unconsciously recognized something of the sort, the speaker pointed out. The pioneers turned their backs on the thin, cut-over soils of the Atlantic seaboard and pushed across the heavy clays of the eastern interior out onto the rich prairie grasslands, which the bison had always preferred.

Now, with mechanized, one-crop farming, we are in danger of producing little but energy-foods (sugars and starches), neglecting the high-protein ration necessary for the best health, Prof. Albrecht declared. A more thorough study of crop ecology based on soils, and a more varied agriculture stressing protein production, he declared, is our greatest present land-use need.

There is no inherent, instinctive basis for our choice of foods, Dr. Margaret Mead, anthropologist of the American Museum of Natural History told the meeting. We learn what to like from our parents and our associates, and our preferences are subject to change from generation to generation. This she regards as fortunate, because it is probable that present and future nutritional researches will turn up many things that will be good for us—and we shall have to learn to like them.

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GEOLOGY

Fossils Aid Temperature Study of Ancient Seas

► **A THERMOMETER** that can reach back into the history of the earth many millions of years and tell the temperature of seas that existed in those ancient days has been discovered.

This thermometer is read by determining the amount of the heavy variety of oxygen in the fossil skeletons of squid-like animals found in the famous chalk cliffs of Dover, Dr. Harold C. Urey, of the University of Chicago's Institute of Nuclear Physics, and Nobelist for his discovery of heavy hydrogen, told the American Association for the Advancement of Science in Washington.

One atom of oxygen 18 times the weight of hydrogen is found in water to every 500 atoms of the ordinary kind of oxygen 16. But the ratio of the two isotopes of oxygen is different after it is used by coral or shell fish in building up its calcium carbonate skeleton. There is more of the heavy sort in the animals than in the sea in which

they lived. And the warmer the ocean the more heavier oxygen.

Dr. Urey and his fellow investigators saw that this meant that the fossils could be used as a very durable thermometer that has been buried for millions upon millions of years. They obtained from museums fossils of belemnite oysters, and other creatures from the Upper Cretaceous chalk deposits in England.

The mass spectrometer, instrument for measuring the weight of atoms, had to be improved until its precision was six times what it was.

Not too definite are the results, but it seems that the 60,000,000 to 70,000,000 years old fossils once lived in a sea that was between 64 and 81 degrees Fahrenheit. This fits in very well with the geological evidence that the ancient seas around what is now Britain were as warm as the tropic oceans of today.

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BOTANY

Tiny American Wildflower Has Giant Relatives

► **GENTIANAS** are not always tiny blue wildflowers. Fifteen-foot, giant gentians with flowers ranging from pale green to golden yellow have been found in the Andes of southern Colombia and northern Ecuador. They have been found as far north as Costa Rica and as far south as Bolivia.

There are about 30 varieties of these gentian-trees in the rainy mountain forests of Latin America, explained Joseph Ewan, of Tulane University, in a report issued by the Smithsonian Institution in Washington.

The gentian family includes a great many widely differing members, and only a botanist would recognize some of the more fantastic relatives. More than 400 kinds, most of them small wild perennials, are known to botanists.

Science News Letter, September 25, 1948

GENERAL SCIENCE

Largest X-Ray Development Lab Honors Scientist

► **THE LARGEST X-RAY** development laboratory in the world has been dedicated in Milwaukee by the General Electric X-ray Corporation.

The new William D. Coolidge laboratory is named in honor of a pioneer scientist in the X-ray field. Dr. Coolidge is director emeritus of the General Electric Research Laboratory, Schenectady, N. Y.

In addition to major contributions to X-ray equipment, Dr. Coolidge is also credited with an important role in the development of the modern incandescent electric light bulb. His work on ductile tungsten in 1908 paved the way for advances in both light bulbs and automobile ignition contacts.

Science News Letter, September 25, 1948

IN SCIENCE

PSYCHOLOGY

Election Winner Is More Popular After Victory

► **NOT MANY PEOPLE** take polls after the election is over. But, if they did, they would find a significant shift to the support of the winning candidate.

Such an after-election poll was actually conducted after Roosevelt was chosen in the last presidential election. More than 2,000 persons were interviewed before the election and the same 2,000 were interviewed again after the election was over. Results were reported to the American Psychological Association in Boston by Dr. Sheldon J. Korchin, of the Veterans Administration Mental Hygiene Clinic in Philadelphia.

Democrats, it was found, became more intense in support of Roosevelt. Republicans moved toward neutrality. Those who, before the election, had been undecided, moved in a pro-Democratic direction.

With each passing year, it was also found, there are more people who "remember" having voted for the winning candidate.

This shifting of support to the choice of the majority is a characteristic of the American culture, Dr. Korchin commented. It is, he said, what gives stability to the American political system.

Science News Letter, September 25, 1948

BIOCHEMISTRY

Find Why Streptomycin Fails Against Lung TB

► **WHY THE WONDER DRUG**, streptomycin, gives disappointing results when used to fight pulmonary or lung tuberculosis seems to have been discovered.

The sputum—spit, it is commonly called—protects the germs, tubercle bacilli, against the streptomycin which will destroy them if it can get at them.

When the tubercle bacilli lie on surface lesions such as ulcers of the larynx and vocal cords, the response to the treatment is dramatic, Dr. Herta Schwabacher of the British Ministry of Health Laboratory has reported in *NATURE* (Aug. 28). But tuberculosis of the lungs is proving resistant to streptomycin treatment.

The inhibiting effect may be either mechanical or chemical, Dr. Schwabacher believes, since it is not the result of acid reaction.

No beneficial effects from treating whooping cough with streptomycin have been obtained, presumably for the same reason.

Science News Letter, September 25, 1948

NE FIELDS

ANTHROPOLOGY

Ghost-Haunted Boars Cause Native Wars

► NEW GUINEA NATIVES go to war because they are afraid of ghosts.

Both male and female ghosts are liable to raise all sorts of havoc unless properly appeased with a war, the natives believe. This strange cause for war was described by Dr. R. F. Fortune, British anthropologist, to the British Association for the Advancement of Science, meeting in Brighton, England.

The natives may fight in order to send enemies of their dead male friends to the other world. Unless this is done, the superstition holds, the ghosts of their friends will be unhappy. Then, the ghosts are likely to get inside the bodies of wild boars.

Boars possessed by male ghosts run wild, breaking down fences and destroying crops.

Another New Guinea tradition calls for the use of military power to revenge marital unfaithfulness. Ghosts figure in this, too. Ghosts of women whose wrongs have not been avenged may possess married women and persuade them to desert their husbands for lovers over the border.

Dr. Fortune's studies supported the theory of the late Sir James Frazer, famed British anthropologist. Sir James held that primitive warfare arises from a desire to appease the ghosts of friends by sending the souls of enemies to another world. Religious duties and military duties have been linked together from pagan to modern times, he believed.

Science News Letter, September 25, 1948

PSYCHOLOGY

People in This Glass House Are Free from Odors

► AN ODOR-FREE double glass house for testing the ability to detect smells was described to the American Psychological Association in Boston.

The observer who is having his sense of smell tested must first take a bath and then he is permitted to enter the antechamber of the glass house. There he is dressed in an odorless envelope after which he can go into the inner room.

Experiments with this glass double chamber were reported by Drs. Dean Foster, of Joseph E. Seagram and Sons, and Karl M. Dallenbach, of Cornell University.

The investigators can control completely the air permitted to enter the "Olfactorium," as it is called. It can be pure, odor-free air or odor-bearing air of known humidity, temperature and pressure. The chamber is equipped with air purification

and control apparatuses. Within the olfactorium the scientists can know exactly what the observer may be expected to smell.

Previous experiments on smell, they point out, have carefully controlled the physical and chemical qualities of the smelly substances, but have paid no attention to the surroundings. The results, they comment, are comparable to tests of hearing conducted on a busy street corner.

Science News Letter, September 25, 1948

ELECTRONICS

Television Receiving Tube Is Now Made of Metal

► A TELEVISION RECEIVING TUBE made largely of metal, demonstrated in New York to a group of scientists, is said to be the first successful tube of the type which can be manufactured on a continuous production basis. It is a 16-inch tube for direct-view home receiving sets.

Metal tubes have several advantages over those made entirely of glass, Samuel Kagan, president of Tel-O-Tube Corporation of America, stated. The development was made by this company. Previous attempts to make tubes of this sort have been none too successful because of difficulties encountered in attempting to join glass to metal in an air-tight seal.

The major portion of the outer shell of the new tube consists of a cone of spun chrome-steel alloy. Only the image screen and the neck or stem which houses the cathode-ray gun are made of glass. These are sealed by a secret process to the metal cone, which has the same rate of expansion as the glass.

Science News Letter, September 25, 1948

AERONAUTICS

Jet on Plane Supplements Conventional Engines

► CONVENTIONAL ENGINES plus jet propulsion feature a new Navy plane. It is designed for carrier operations. Two reciprocating engines are located under its wings, and a turbo-jet engine is in the tail of the fuselage.

In normal operations, the conventional engines will be used. When added speed is needed, the jet can be cut in. The reciprocating engines are Pratt and Whitney Wasp Majors, and the jet is a GE-Allison turbo-jet.

This new plane, which has already completed initial flight tests, was constructed by North American Aircraft Company, Los Angeles. In service it will be known as the XAJ-1. It carries a crew of three, has tricycle landing gear, high wing, and four-bladed propellers. Outer wing panels fold inboard and the vertical tail folds onto the right surface of the horizontal tail.

Performance figures are not yet available, but it will be considerably faster and able to carry a heavier bomb load than present carrier types.

Science News Letter, September 25, 1948

PSYCHOLOGY

Childhood Morale Can Help Prevent or Control Fear

► TO CONTROL OR PREVENT terror, it is necessary to lay the foundations of morale in childhood, the British Association for the Advancement of Science, meeting in Brighton, England, learned from a psychologist, Mrs. F. M. Austin.

Neurotic fear or imagined terrors were not what Mrs. Austin referred to. She discussed the normal fear caused by such things as the noise of a dive bomber attacking, the feeling of sudden dropping in an airplane, the sensation of suffocation or loss of security.

Here are some of the preventives observed in action in wartime England: Self-assertion, pugnacity, curiosity, desire to be with others, protectiveness, reliance on others, the doing of something, experience, knowledge, habit.

There are other, less tangible influences, that help a person to control his panic. They are, Mrs. Austin said, ideals, ambitions, self-approval, sense of duty, and social approval.

These influences interact, she said. Sometimes one is dominant, sometimes another. The way an adult behaves when face to face with great danger depends, she said, upon the integration and balance of his personality.

Science News Letter, September 25, 1948

PSYCHIATRY

Sadism, Masochism Belong In Same Brain-Sick Cycle

► SADISM AND MASOCHISM, the desire to hurt and the yearning to be hurt, are opposite faces of the same bad emotional coin. The same emotionally disturbed individual is apt to be both sadist and masochist by turns, Dr. Eilhard von Domarus of the Association for the Advancement of Psychotherapy told scientists meeting in Washington for a special symposium on cooperation and conflict among living organisms.

Both tendencies exist in the upset individual at the same time, the speaker explained, but we call him sadist or masochist according to which happens to be predominant at the moment. He may start out as a sadist, hurting others to compensate for some lack or frustration in himself. Then a sense of guilt or shame at his cruelty overcomes him, and he exposes himself to hurt or humiliation to compensate for that. Then he may become a sadist again—and the cycle repeats itself without end. In extreme cases, the sadist may actually kill and eat his victim.

In organized societies, Dr. von Domarus continued, democracy tends to promote the healthy, normal mental state of mind termed symbiosis. Autocracies produce the unhappy sadism-masochism cycle.

Science News Letter, September 25, 1948

ASTRONOMY

Taurus Shines in East

Appearance of heavens in October evenings heralds the coming of winter. A guide to autumn constellations is the triangle formed by Vega, Deneb and Altair.

By JAMES STOKLEY

► WITH TAURUS, the bull, in the eastern evening sky, the appearance of the heavens brings to our attention the fact that winter is but a couple of months off. For Taurus is one of the constellations that shine so conspicuously in the south on the evenings of January and February.

Its position (at 10:00 p. m., your own kind of standard time, at the first of the month, and an hour earlier on the 15th) is shown on the accompanying maps. Low in the northeast is shown Aldebaran, the brightest star of Taurus. Next, to the left, appears Auriga, the charioteer, with first magnitude Capella. Above Aldebaran is the little cluster of stars known as the Pleiades, the "seven sisters" of mythology.

Toward the west we can see three other stars of the first magnitude. One, shown on the map of the northern half of the sky, is Vega, in Lyra, the lyre. Above this is Cygnus, the swan, with brilliant Deneb as its brightest orb. To the left (on the southern map) we find Altair, marking Aquila, the eagle. These three stars—Vega, Deneb and Altair—form a large triangle in the sky which is a good figure to know if you want to learn the autumn constellations.

Though it does not contain any first magnitude stars, another characteristic figure that makes a good guide in finding one's way in the sky, is high in the south, mainly in Pegasus, the winged horse. This is the "great square," of which the upper left-hand star is Alpheratz, in the constellation of Andromeda, which represents a mythical princess. Below and to the left of the square we see the fishes, Pisces, one of the constellations of the zodiac, through which the sun, moon and planets seem to move. Aquarius, the water carrier, next to the right, is also one of them.

Fish Prominent in South

Below this group is Piscis Austrinus, the southern fish, with another first magnitude star, Fomalhaut, now as high as it ever rises in these northern latitudes. This fish is a prominent constellation in the southern hemisphere, where it comes overhead.

Brighter, even, than any of the stars mentioned is another object visible in the southwest, in the constellation of Ophiuchus, the serpent-bearer. This is the largest of the planets that, like the earth, revolve about the sun. It is Jupiter, with a diameter of 88,700 miles, or nearly 11 times that of the earth.

Though Jupiter is the only planet now

visible in the evening sky, to the east, rising a few hours before the sun in the constellation of Leo, the lion, Venus shines. Of magnitude minus 3.7, it greatly exceeds any other star or planet. To the east of Venus, at the beginning of the month, and about a sixty-fourth as bright, is the planet Saturn. Venus passes it on Oct. 8, two days after it passes the star Regulus.

The month of October brings two eclipses, though one just barely gets under the wire to start before the last day of the month ends, and will not be visible from the United States at all.

The shadow of the earth, and that of the moon as well, has two parts. The dark, inner core, called the umbra, is the region from which the planet completely hides the sun. Around this is a larger region, called the penumbra, where the sun is only partially hidden. When the moon's umbra strikes the surface of the earth, there is a total solar eclipse, visible along the path which it traces as it moves toward the east. In the larger area covered by the penumbra there is a partial eclipse.

Track of Partial Eclipse

During the night of Oct. 31, while the sun is below the horizon for people in North America, the moon's shadow thus traces out an eclipse track starting in Kenya, East Africa, and crossing the Indian and South Pacific Oceans, ending southeast of Australia. The region covered by the penumbra, where there is a partial eclipse, includes south and east Africa, the Indian Ocean, Australia and New Zealand. The first small partial eclipse is visible from a point in Africa, in Ethiopia, at 10:19 p. m.,

EST, so that is why it manages to get into a description of astronomical events in October.

The earlier eclipse, however, is visible from the United States, and concerns the moon. On the evening of Oct. 17 our satellite gets entirely into the earth's penumbra, though not into the umbra at all. Consequently, this is called a penumbral eclipse. Since at no time will the sun be completely hidden from any part of the moon, it will not get as dark as at some lunar eclipses. However, at its height, enough sunlight should be cut off to give the moon, then in the full phase, a decidedly pale appearance.

Time of Greatest Effect

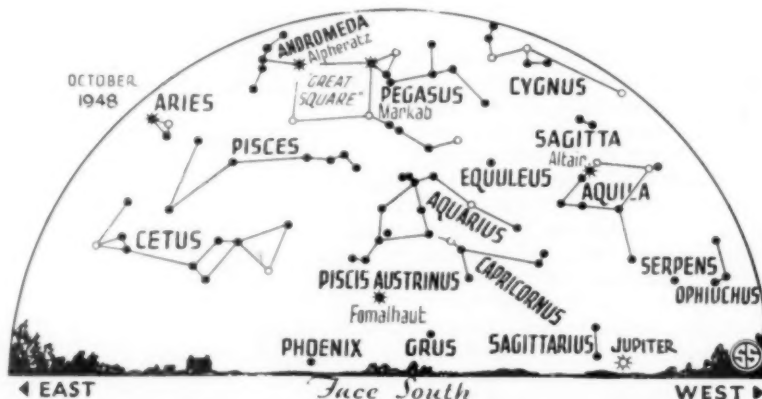
At 7:13 p. m., EST, the moon starts entering the outer shadow of the earth, and beginning at 9:10 it is completely immersed, most deeply at 9:35. By this time, the effect on the moon should be greatest. At 10:00 p. m. the moon starts to leave the penumbra and at 11:57 it is completely out of it.

Time Table for October

Oct.	EST	
1	11:00 a. m.	Moon nearest, distance 222,300 miles
2	2:42 p. m.	New moon
5	1:13 p. m.	Moon passes Mars
7	9:08 p. m.	Moon passes Jupiter
8	3:00 p. m.	Venus passes Saturn
9	5:10 p. m.	Moon in first quarter
13	4:00 p. m.	Moon farthest, distance 251,900 miles
17	9:23 p. m.	Full moon, penumbral lunar eclipse
22	early a. m.	Meteors of Orionid shower, radiating from constellation Orion
25	8:41 p. m.	Moon in last quarter
27	12:21 p. m.	Moon passes Saturn
29	2:02 a. m.	Moon passes Venus
	3:00 p. m.	Moon nearest, distance 226,200 miles

Subtract one hour for CT, two hours for MT, and three for PT.

Science News Letter, September 25, 1948



◊ * ◊ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



Truman Address

(Continued from page 199)

is precisely in this area that we, as a nation, have been weakest. We have been strong in applied science and in technology, but in the past we have relied strongly on Europe for basic knowledge.

Pure research is arduous, demanding, and difficult. It requires unusual intellectual powers. It requires extensive and specialized training. It requires intense concentration, possible only when all the faculties of the scientist are brought to bear on a problem, with no disturbances or distractions.

Some of the fundamental research necessary to our national interest is being undertaken by the Federal Government. The Government has, I believe, two obligations in connection with this research if we are to obtain the results we hope for. First, it must provide truly adequate funds and facilities. Second, it must provide the working atmosphere in which research progress is possible.

Program in Many Fields

As to the first point, the Government is developing impressive programs in many scientific fields. Fundamental research is being carried on for the National Military Establishment in the laboratories of the armed forces, of industry, and of our universities. The Atomic Energy Commission has been pushing its extensive research. The National Advisory Committee for Aeronautics has expanded its many aeronautical developments. The Federal Security Agency has engaged in extensive medical studies, in its own laboratories like the National Institutes of Health, and through grants to colleges and universities. Other Federal agencies, such as the Departments of Commerce, of Agriculture, and of the Interior, have pursued vigorous programs. The Inter-Departmental Committee on Scientific Research and Development, appointed by me last March, aids in coordinating the Government's many research programs. I sincerely hope that these programs will be further developed and coordinated by the early passage of a National Science Foundation bill.

The second obligation of the Federal Government in connection with basic research is to provide working conditions under which scientists will be encouraged to work for the Government. Scientists do not want to work in ivory towers, but they do want to work in an atmosphere free from suspicion, personal insult, or politically motivated attacks. It is highly unfortunate that we have not been able to maintain the proper conditions for best scientific work. This failure has grave implications for our national security and welfare.

There are some politicians who are under the impression that scientific knowledge belongs only to them. They seem to feel that it is dangerous to let scientists know anything about scientific developments in this country.

Telegram from Scientists

This situation has been of increasing concern to me. It was highlighted by a telegram I received last week from eight distinguished scientists. These men expressed their alarm at the deterioration of relations between scientists and the Government because of the frequent attacks which have been made on scientists in the ostensible name of security. The telegram points out that the actions of certain groups are "creating an atmosphere that makes men shun Government work," and that the Federal Government is losing the services of excellent scientists because they have been looked upon from certain quarters as "men not to be trusted." The telegram points out that scientists fully appreciate the need for sensible security measures. But scientists very understandably are reluctant to work where they are subject "to the possibility of smears that may ruin them professionally for life."

That telegram was a balanced and sober presentation of a vital problem that concerns every American.

Continuous research by our best scientists is the key to American scientific leadership and true national security. This indispensable work may be made impossible by the creation of an atmosphere in which no man feels safe against the public airing of unfounded rumors, gossip and vilification. Such an atmosphere is un-American. It is

the climate of a totalitarian country in which scientists are expected to change their theories to match changes in the police state's propaganda line.

I hardly need remind this Association that it is primarily to scientists that we owe the existence of our atomic energy enterprise.

It was the scientists who first saw the possibility of an atomic bomb. It was the scientists who proved the possibility. It was the scientists who first saw the need of security measures, and who on their own initiative clamped down a tight lid of secrecy on all experiments. It must not be forgotten for a moment, and certainly it must not be obscured by any smear campaign, that but for the scientists we would have no atomic energy program.

We are only in the beginnings of the atomic age. The knowledge that we now have is but a fraction of the knowledge we must get, whether for peaceful uses or for national defense. We must depend on intensive research to acquire the further knowledge we need. We cannot drive scientists into our laboratories, but, if we tolerate reckless or unfair attacks, we can certainly drive them out.

These are truths that every scientist knows. They are truths that the American people need to understand.

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Set, complete \$150.00 fob Philadelphia

SET NO. 1

Recommended for primary schools

Maximum-minimum thermometer, Navy type. Hygrometer, fixed wet and dry bulbs. Baroguide, aneroid, with forecast dial. Rain and snow gage, 3" diameter. Wind vane, NESW letters. Instrument shelter for thermometers. *Instruction book:* "Techniques of Observing the Weather," Haynes. Set of U. S. Weather Bureau pamphlets. Record forms for observations.

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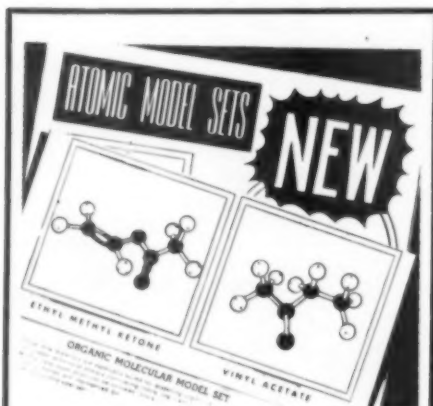
The average annual consumption of *eggs* in the United States is 380 per person.

Paint in the can should be stirred, not shaken; shaking is apt to result in minute air bubbles which may cause pin prick blisters on the finished job.

Deciduous trees with small leaves thrive best in *high-wind areas*; the small leaves spin in the wind and stay on the tree, while large leaves of other trees are pulled off.

A disease that appears to be native to the soybean belt of the United States called *brown stem rust*, is caused by a fungus that has the peculiarity of growing rapidly only in rather cool weather.

Six varieties of *trees*, used to repair 1944 hurricane damage, have been found to do best in the salt spray and strong winds on Cape Cod, Mass.; they are honey locust, Wisconsin golden willow, Austrian pine, Japanese black pine, Aspiratte spruce and the native pitch pine.



Atoms are represented by brightly colored rubber spheres, and bonds by plastic tubing. With these sets chemists, metallurgists, mineralogists and crystallographers can easily assemble large models showing the basic structure of molecules and crystals. Here is an ideal visual aid for classroom and laboratory, from elementary chemistry to advanced research.

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Science has no political affiliation. Concern for our national security is non-partisan. Sober recognition of scientific research as the basis of our future national security should certainly be non-partisan. All Americans have a solemn obligation to avoid those methods and procedures which are impeding scientific research—whether adopted mistakenly with good intent, or advocated in the name of security by men with other axes to grind.

My emphasis tonight has been on the physical and biological sciences. These are obviously in the forefront in terms of our industry and technology. But the social sciences and related fields are at least as important in the present stage of human affairs.

The physical sciences offer us tangible goods; the biological sciences, tangible

cures. The social sciences offer us better ways of organizing our lives. I have high hopes, as our knowledge in these fields increases, that the social sciences will enable us to escape from those habits and thoughts which have resulted in so much strife and tragedy.

Now and in the years ahead, we need more than anything else the honest and uncompromising common-sense of science. Science means a method of thought. That method is characterized by open-mindedness, honesty, perseverance, and, above all, by an unflinching passion for knowledge and truth. When more of the peoples of the world have learned the ways of thought of the scientist, we shall have better reason to expect lasting peace and a fuller life for all.

Science News Letter, September 25, 1948

TECHNOLOGY

Dishtowels from Asbestos

► FLUFFY FIBERS of the mineral asbestos are being woven with cotton to produce a truly absorbent dishtowel.

The fabric is 20% asbestos and 80% cotton. Tiny bundles of asbestos fibers in the cloth blot up the water.

The fabric is dyed after being woven, but only the cotton fibers absorb the color. Thus the solid-colored towels, sold under the trade name of Carosel, are decorated with tiny flecks of white—the undyed asbestos.

Fire-resistant cloth is also made of asbestos and cotton fibers. This material contains 80% asbestos, 20% cotton—just the reverse proportions of the dishtowel fabric.

Useful in fighting fires, this material serves in the home as ironing board covers and “slippers” for hot irons. The fabric, which weighs only 22 ounces per square yard, is used in electrical insulation, laundry mangle and press covers, fireproof draperies and industrial rubber goods.

Cotton is mixed with the fireproof asbestos to give the fabric a firmer construction. Slippery asbestos fibers do not hold together well, so cotton is employed to anchor them in place. The cotton is combustible, but because of the large percentage of asbestos fibers the fabric will not support a flame for more than an instant or so.

The strength of cotton yarn is almost doubled by a new chemical and mechanical treatment. Any type of conventional cotton ply yarn can be used. The chemical treatment works on the natural waxes of the cotton fibers to reduce their tendency to slip over each other; a stretching operation further increases the strength of the cotton. The yarn's tensile strength is improved as much as 70% to 90%.

This extra strength makes the yarn especially valuable for use in rubber-fabric conveyor belts, high-pressure hose and other industrial rubber products where high

strength and low stretch are important.

Some yarns are made to stretch, then snap back into shape. These elastic yarns are becoming increasingly popular for home use. Buttons can withstand sudden tugs when sewed with elastic yarn. Ruffling for curtains can be shirred and little girls' dresses smocked on the sewing machine when this thread is used.

The base of the elastic yarn is a rubber core, around which threads are wound. At least two threads are always applied, wound in opposite directions, to balance the yarn and keep it from twisting.

Samples of these specialized yarns and textiles have been collected for you through the cooperation of the United States Rubber Company and Science Service. Also included among the nine specimens are an elastic yarn only 1/125 of an inch in diameter and a fabric of permanent starchiness.

These specimens, with a leaflet telling how they were made and experiments you can perform with them, may be secured by sending 50 cents to Science Service, 1719 N St., N. W., Washington 6, D. C. Just ask for unit No. 95, the Specialized Textiles Unit of THINGS of science.

Science News Letter, September 25, 1948

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BIOCHEMISTRY

Plants Use Weapons

► PLANTS of all kinds and sizes, from bacteria to trees, use chemical weapons in their struggle for living space in a crowded world. How they do it was developed in discussions at the opening session of a special symposium on conflict and cooperation among organisms, held in Washington.

Chemical competition of this kind is not known to be common among the higher plants; species that are chemically unfriendly to their neighbors generally betray that fact by the sparseness of other plant growth in their vicinity. Prof. James Bonner of the California Institute of Technology told of a plant-killing substance produced in the leaves of wormwood, the shrub used in flavoring such liquors as vermouth and absinthe. Of a large number of weeds, only one species of chickweed and one of jimsonweed could tolerate it. A Southwestern shrub with yellow daisy-like flowers, known as encelia or bush sunflower, secretes a poison so deadly to other plants that a small handful of its dead leaves would kill potted tomato plants.

Some plants produce their chemical weapons through their roots instead of their leaves. Prof. Paul Sears of Oberlin College joined Prof. Bonner in calling attention to the fact that few plants, other than grasses, will grow on soil underlain by the roots of black walnut trees.

In some instances these root secretions are poisonous to seedlings of the species that produce them. Prof. Bonner called attention to the common cultivated bromegrass as a case in point.

Science News Letter, September 25, 1948

Molds Versus Bacteria

► CHEMICAL competition appears to be very widespread among bacteria, molds and other lower plant forms, Prof. Robertson Pratt of the University of California stated. Lately man has been taking advantage of some of these substances, like penicillin and streptomycin, for his own purposes.

Prof. Pratt pointed out that some bacterial species meet the attack of these antibiotics by quickly evolving resistant strains. On the other hand, it has been observed that bacteria dying of penicillin poisoning may do a disservice to their survivors by releasing a growth-promoting substance into the medium, that renders the remaining bacteria more susceptible.

Science News Letter, September 25, 1948

Competition Not Evil

► IN DISCUSSING competition among plants, Prof. Sears cautioned against attaching to such conflict the "overtones of evil" which we Occidentals are apt to read into human strife. Young trees in a forest, shading each other out until finally only one remains where scores or hundreds started, are only carrying out a natural and necessary thinning process.

There is even something resembling cooperation between trees and shrubs, where Eastern forest tries to invade Western prairie. Prof. Sears stated that the trees do not go out directly into the grassland, but that the forest has a border of shrubby growth such as sumac, blackberry and rabbit-brush, that constantly pushes ahead as a kind of advance guard.

Science News Letter, September 25, 1948

INVENTION

New Discharge System For Airplane Cargoes

► AN ENDLESS belt conveyor system, now ready for Air Force tests, will drop in the air from the rear of the plane 12,000 pounds of cargo in five seconds, it was revealed by Fairchild Aircraft, of Hagerstown, Md.

It is a double conveyor system, designed for the Fairchild C-82 transport plane, and is electrically operated from the pilot's position. Two conveyors extend the entire length of the ship's hold. Each of the two is in three sections, two feet wide and 9.5 feet in length. Each is individually powered. The system can be used also in Fairchild's larger and more powerful troop and cargo plane, the C-119B.

Science News Letter, September 25, 1948

PSYCHOLOGY

Find Hay Fever May Be Induced by Unhappiness

► HAY FEVER or asthma can sometimes be a hidden way of saying, "I don't like the way my parents treat me," or, simply, "I am unhappy."

Allergies such as asthma may represent attempts to gain sympathy or they express

hostility and mask a feeling of guilt or anxiety. Sometimes they can be cured by getting rid of hostility. This is the conclusion of Drs. Hyman Miller and Dorothy W. Baruch, both of Beverly Hills, Calif., who made a special study of 22 asthma patients. Their patients had all been previously treated for allergies without success. They all had personality problems. There were seven men, eight women and seven children in the group.

Some of the patients realized that there was some connection between their allergies and their emotions. One 18-year-old girl who suffered from hay fever said, "My whole life is stopped up like my nose."

"If you don't get my mother back, I'll cough," cried a five-year-old asthma patient when he saw her driving away in a car. "I'll get asthma. Then she'll have to come back."

His mother was too busy to pay any attention to him except when he was sick, the psychologist found out. After five months of treatment he was cured when he learned other ways of getting affection.

The patients were urged to tell their emotional difficulties to the psychologists. All of them, the psychologists found, tended to get asthmatic attacks when they were talking about something that was important to them emotionally, or something about which they felt guilty.

Under psychological treatment 21 out of the 22 patients showed improvement, the doctors reported in the JOURNAL OF CONSULTING PSYCHOLOGY (March-April).

Science News Letter, September 25, 1948

Telephone Shoulder Cradle

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Tele-Rest shoulder cradle gives phone users complete freedom of both hands. Fits any portable phone. Compact, unbreakable, adjustable.

A convenient phone accessory for executives, order clerks, secretaries, professional people and housewives. When the telephone is placed to the ear, the cradle rests comfortably on the shoulder, permitting the user to take dictation, write notes, check files or search for reference material. Tele-Rest is made of cast aluminum with rubber shoulder grip. Adaptable for either ear. (Add postage foreign orders)

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PSYCHOLOGY

Insects See Ultraviolet

Color vision has been demonstrated to exist in the lower animals without backbones and in some insects. Among mammals, only monkeys, apes and man see color.

► A BULL cannot see the red color of the rag waved at him, but an insect can "see" ultraviolet that ordinarily is not detected by humans. These facts about animal color vision were among many reported to the British Association for the Advancement of Science meeting in Brighton, England, by Dr. R. J. Pumphrey.

It may be, he said, that the insects actually detect the ultraviolet light as a bluish fluorescence of the optic media of the eye rather than through color perception as we generally think of it.

Color vision, when it does occur in animals, is rather closely similar to that of man, Dr. Pumphrey reported.

It is difficult to test, however, especially in wild animals. You can be sure that an animal distinguishes color only if color vision not only exists in the animal, but if it is important to him so that he pays some attention.

Color vision has been demonstrated be-

yond scientific doubt in the lower animals without backbones and in some insects. Among vertebrates other than mammals, it has been found in some bony fishes, reptiles and birds.

The only mammals that can see color are some monkeys, apes and man.

The case for cephalopod molluscs and crustacea is "non-proven."

For the rest of the animal kingdom it is probable that color vision does exist or, as Dr. Pumphrey says, "it has no importance for the animal."

There is an interesting difference between insect color vision and that of man, Dr. Pumphrey said. Insects see color as long as they can see at all. But vertebrates cannot see color when the light grows faint. As the old saying goes, "At night, all cats are gray."

All nocturnal vertebrates are probably color blind, Dr. Pumphrey said.

Science News Letter, September 25, 1948

GENETICS

Ills Lurk in Healthy

► MANY apparently healthy persons are nevertheless carriers of hereditary diseases which they can transmit to their children. How to spot such unwitting menaces is one of the big problems in building up a more healthy society, Dr. James V. Neel of the University of Michigan stated in

Washington in the principal address given before the meeting of the Human Genetics Society of America.

A healthy-appearing person can be the carrier of disease-causing genes in either of two ways, the speaker pointed out. He may be destined later to develop the disease, but the malady may be of such a nature that it comes on later in life, after he has married and had children. Among hereditary diseases that develop after early maturity, Dr. Neel mentioned gout and Huntington's chorea.

In addition to being hereditary, gout is sex-linked; that is, it occurs far more often in men than in women. However, a high concentration of uric acid in the blood, one of the less conspicuous syndromes of the disease, is often found in non-gouty relatives, both male and female, of the gouty patients. This may be used in detecting "gouty families."

Since Huntington's chorea is primarily a disease of the central nervous system, it produces a typical brain-wave pattern. This pattern manifests itself even in still-healthy young persons who are doomed to develop the defect later in life. One possible use of this test which Dr. Neel suggested is on young immigrants, to prevent the entrance of bearers of this particular hereditary disease.

The second type of healthy carrier of hereditary disease, Dr. Neel stated, is the person who will never develop the malady himself but who carries a recessive gene for it. This gene is kept suppressed by the presence of an opposite, dominant gene, but it is ready in his germ-cells to mate with a similar recessive to produce an unfortunate child, doomed to disaster from the moment of his conception.

As an example of such a defect, the speaker described a peculiar kind of anemia, which occurs only in persons of Mediterranean origin or ancestry. When it develops, it is fatal during childhood, so that its victims cannot themselves transmit it. However, their seemingly healthy brothers and sisters carry the trait and can pass it on. Its presence in such persons is hard to detect, but certain peculiarities in their blood do betray it.

The Human Genetics Society of America is a new scientific body which held its first meeting in Washington. Its president is Prof. H. J. Muller of the University of Indiana, who received a Nobel Prize award for his demonstration of the possibility of producing evolutionary changes in germ cells by bombarding them with X-rays.

Science News Letter, September 25, 1948

PSYCHOLOGY

Night Vision in Young Better Than in Old

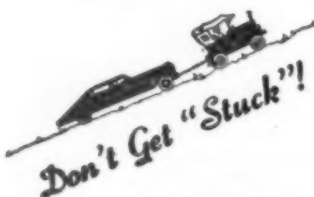
► OLD PEOPLE cannot see as well on a dark night as younger men, Dr. James E. Birren, of Baltimore City Hospitals, told the American Psychological Association in Boston. Dr. Birren compared 66 men aged 43 to 80, living in the Baltimore Infirmary, with 25 Navy enlisted men aged 18 to 23.

Some of the older men had structural defects which might account for the lack of dark adaptation. But others had no such defects.

Individual differences in the loss of ability to see in the dark are, however, great. The range for the older men is more than twice as great as for the younger men.

Science News Letter, September 25, 1948

HOW TO BE AN EXPERT CAR BUYER



This is the book the public has been waiting for. Everyone should read it. Do you know the 36 tricks used to defraud new and used car buyers? A fair price to pay? A fair trade-in? Fair financing and insurance? The cost of running a car? How to spot a "lemon"? These and many other questions are clearly answered in 96 easily read pages. "Even a hasty reading of your valuable book should prevent most people from falling into the most obvious mistakes." . . . Mr. R. J. Schmunk, president of the American Automobile Association, Washington, D. C. On sale at Macys, New York; Gimbel's, Phila.; Krochs, Chicago. Only \$1; COD orders \$1.18. Cummings Enterprises, Keystone State Bldg., Phila. 7, Pa.

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Books of the Week

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A. S. T. M. STANDARDS ON COAL AND COKE (WITH RELATED INFORMATION)—A. S. T. M. Committee D-5—*American Society for Testing Materials*, 156 p., illus., paper, \$2.00. Sampling methods, chemical analysis, methods of testing, specifications and classifications, and definitions of terms.

CAUSES OF INDUSTRIAL PEACE UNDER COLLECTIVE BARGAINING, CASE STUDIES I: CROWN ZELLERBACH AND THE PACIFIC COAST PULP AND PAPER INDUSTRY—Clark Kerr and Roger Randall—*National Planning Association*, 78 p., paper, \$1.00.

HUNTING AMERICAN LIONS—Frank C. Hibben—*Crowell*, 225 p., illus., \$3.75. The romantic story of the author's own experiences in the hunt, illustrated beautifully by Paul Bransom. The author is well known as an anthropologist.

IONOSPHERIC RADIO PROPAGATION—Staff, Central Radio Propagation Laboratory, National Bureau of Standards—*Govt. Printing Office*, 209 p., illus., paper, \$1.00. A technical book setting forth the physical and mathematical theory underlying the principles of radio communication by reflection from the ionosphere and showing the relation between the theory and practical problems of radio communication.

LET'S LOOK INSIDE YOUR HOUSE—Herman and Nina Schneider—*Scott*, 40 p., illus., \$1.50. An attractive science book for children devoted to common applications of scientific principles in the home.

LET'S TELL THE TRUTH ABOUT SEX—Howard Whitman—*Pellegrini & Cudahy*, 242 p., \$2.50. A book of information for parents to pass on to their children or for them to assimilate themselves.

THE NATION'S HEALTH: A Ten Year Program—Oscar R. Ewing—*Govt. Printing Office*, 186 p., illus., paper, \$1.00. The United States is steadily improving its health record but each year 325,000 people die whom we have the knowledge and skill to save and 4,300,000 man-years of work are lost annually through bad health.

NEW THREATS TO AMERICAN FREEDOMS—Robert E. Cushman—*Public Affairs Committee*, 32 p., illus., paper, 20 cents. Here is a brief, clear definition of just what are the rights of Americans under our constitution and a description of some of the dangers that now threaten them.

THE PATENT SYSTEM II—Brainerd Currie, Ed.—*Law and Contemporary Problems*, 145 p., paper, \$1.00. The second of two symposiums on this subject published in the quarterly journal *Law and Contemporary Problems*.

READINGS IN THE PHYSICAL SCIENCES—Harlow Shapley, Helen Wright and Samuel Rapport—*Appleton*, 501 p., \$3.00. Here are selections from the original writings of great scientists, carefully chosen to give you an understanding of the physical world as well as a conception of the habits of thought which have built the edifice of modern science.

TAKE OFF YOUR MASK—Ludwig Eidelberg—*International Universities Press*, 230 p., \$3.25. Conversations between patients and the psychoanalysts are here set down in a most

interesting form in order to give the general reader a better idea of mental ills and the way in which psychoanalysis can aid in relieving them.

THE UNITED NATIONS: Three Years of Achievement—*Department of State*, 19 p., paper, 10 cents. October 24 marks the completion of three years since the Charter of the United Nations came into force—three years of "exploring old problems and of seeking new solutions." It is a story of steady progress against difficult odds.

YOUR INCOME TAX—J. K. Lasser—*Simon and Schuster*, 168 p., paper, \$1.00. A new edition of a guide found useful by many.

Science News Letter, September 25, 1948

AGRICULTURE

Tractors Are Increasing Danger of Soil Abuse

➤ THE change from horses to tractors on American farms has increased the danger of soil abuse.

This is the conclusion of three soil scientists of the U. S. Soil Conservation Service at Cornell University who have completed a study of the effects of organic matter and erosion on soil packing in New York State.

A soil low in organic matters when subjected to the compacting force equal to the rubber tire of a two-plow tractor, may pack to a point that water will move through the soil very slowly, Dr. John Lamb, Jr., said. On the other hand, organic matter protects the subsoil against compaction. The amount of organic matter and intensity of the packing force help determine the amount of moisture a soil can hold.

The packing force used in the soil tests was equal to a tractor or empty truck.

Among the results: For each of the soils studied, the sample with the highest degree of packing was lowest in organic matter.

"With more and more heavy equipment coming onto our farmlands today, we need to be more concerned than ever about maintaining a high organic-matter content in the soil," Dr. Lamb advised.

Science News Letter, September 25, 1948

MEDICINE

Screening Program Set Up For Cancer-Finding Tests

➤ A DRIVE is starting to put on trial the many varieties of tests for detecting cancer. Tests which pass careful screening for accuracy and simplicity will be given a mass try-out through a cooperative program.

The new program will be under the direction of the National Cancer Institute of the U. S. Public Health Service, with the cooperation of a half-a-dozen medical

schools and hospitals, Dr. J. R. Heller, director of the Institute, revealed.

Tests selected as showing promise in the laboratories will first be applied to small groups in the cooperating institutions. If they prove effective in detecting cancer in its early, curable stages, they will be used on thousands of persons with and without cancer, particularly those passing through the U. S. Public Health Service Medical Center at Hot Springs, Ark., Dr. Heller said.

"The program is still in the blueprint stage," he pointed out, "but we are at the point of crystallizing our thinking and of appointing someone to head the program and get it under way."

Three aims of this program are: sorting out the most effective detection tests; refining the most promising tests; and developing new tests for cancer.

"Even if the cause and cure (of cancer) were unexpectedly found tomorrow," Dr. Heller declared, "there would still be need for effective diagnostic tests."

Science News Letter, September 25, 1948



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☼ **UTILITY SPRAYER**, for home or multiple farm uses with either light liquids or heavy emulsions, can be attached to a gallon can or used with an open pail. It is a two-nozzle, hand-operated device that works like the ordinary trombone, and comes equipped with two individual replaceable nozzles.

Science News Letter, September 25, 1948

☼ **FOLDING BACK-REST** for bleacher seats at the ball game, recently patented, consists of a seat section with an upward-curved rear extension to which is hinged the back rest. When not in use, the back rest folds flat over the seat.

Science News Letter, September 25, 1948

☼ **REDUCING VALVE**, for use in laboratories and where gas is used industrially, gives higher delivery pressure with better control because the gas pressure is used to regulate the delivery pressure. Pressure is governed by admitting gas into a ballast chamber above a diaphragm until the desired figure is reached.

Science News Letter, September 25, 1948

☼ **AIR-FILLED "SWAN"** for the tiny tot, shown in the picture, is one of a line



of new inflatable toys made of vinylite plastic. Others, designed for use in bathtubs, represent alligators, fish and frogs.

Science News Letter, September 25, 1948

☼ **ENGINE ANALYZER**, for use in airplanes in flight, locates and identifies improperly functioning parts of the complete powerplant and provides instantaneous and continuous indications of engine troubles. Doing this during flight means that flight engineers upon landing can give accurate instructions to maintenance crews.

Science News Letter, September 25, 1948

☼ **VACUUM CLEANER**, for picking up the almond harvest shaken from the trees, meets a special problem in gathering the nuts and not the dust. Its nozzles have an intake two inches wide and 19 long. The width of the flanges and the exact height at which they work above the surface determine their effectiveness.

Science News Letter, September 25, 1948

☼ **PICNIC KIT** does double duty as a carrying case and as a table. Covered with canvas duck, its two equal box-like halves open to form a flat table which is supported by four fold-in legs like those on the familiar card table. As a case, it holds two vacuum bottles, two stainless-steel sandwich boxes and four plastic cups.

Science News Letter, September 25, 1948

• Nature Ramblings by Frank Thone •

► **CROP PLANTS** native to this hemisphere form an old and familiar catalog: corn, potatoes, tobacco, beans, pumpkins, squashes and all the rest. However, all these came from the south, from the tropics and subtropics. Even the ones that the Indians of the East and Midwest were cultivating when the first white settlers came had been brought to them by nameless prehistoric forerunners of today's agricultural extension workers.

But a whole array of highly appreciated fruits and nuts occur naturally in the more heavily populated parts of the United States. Indians used them though they did not cultivate them, finding enough for their needs in the wild state. European settlers, finding them to their taste, brought them into orchards and gardens, some in Colonial times, some more recently.

Among the earliest, and certainly among the most successful, were our native grapes. Old-World grapes did not take very kindly to our Eastern conditions, though they do very well in California. But three species native to the East were made into

Success Stories



good table and juice grapes by selection and hybridization, and became the foundations of such types as Concord, Catawba and Scuppernon.

Cranberries and blueberries were long gathered for the white man's market just as the Indians gathered them, direct from the wild. In recent times, however, great areas of Eastern bog and acid-soil uplands have been devoted to the cultivation of improved varieties of these native berries.

Native species of strawberry, raspberry, gooseberry, currant and plum have been used in producing successful hybrids with European, Asiatic and South American fruits. Our American wild crabapples, however, have not been used in breeding new apple varieties, probably because they are too sour and too puckery with tannin. Three native fruits that are still largely neglected are pawpaws, persimmons and red haws.

The roster of native nuts that have made good in cultivation is shorter, but contains some notable items. Outstanding is the pecan, native to our South. More recent, but highly promising, has been the cultivation of two of its relatives, black walnut and shellbark hickory. Best-flavored of all chestnuts was our native species, now virtually extinct from the deadly attack of the blight fungus. Sole chance of survival of the American chestnut flavor lies in the use of stray flowers still found, as source of pollen for producing hybrids with the better kinds of Asiatic chestnuts.

Science News Letter, September 25, 1948